

NATURAL RESOURCES CONSERVATION SERVICE
PACIFIC BASIN AREA
CONSERVATION PRACTICE STANDARD
IRRIGATION WATER MANAGEMENT
(Hectare, Acre)
CODE 449

DEFINITION

Determining and controlling the rate, amount, and timing of irrigation water in a planned and efficient manner.

PURPOSE

To effectively use available irrigation water supply in managing and controlling the moisture environment of crops.

- To promote the desired crop response;
- To minimize soil erosion;
- To minimize the loss of plant nutrients;
- To improve efficiency of water used; and,
- To control undesirable water loss, and to protect water quality.

CONDITIONS WHERE PRACTICE APPLIES

This practice is suited to all areas are capable of being irrigated that have a water supply of adequate quality and quantity.

An adapted conservation irrigation system must be available, either a portable system or a system that is established, on the land to be irrigated.

The irrigator shall have the knowledge and ability to manage and apply irrigation water in such a manner that the objectives mentioned under "Purpose" can be reasonably obtained. The knowledge should include:

1. How to determine when irrigation water should be applied, based on the rate of water used by crops and on the stages of plant growth.
2. How to measure or estimate the amount of water required for each irrigation, including the leaching needs.
3. How to determine the normal time needed for the soil to absorb the required amount of water and how to detect changes in the intake rate.

4. How to adjust stream size, application rate or irrigation time to compensate for changes in such factors as intake rate or the amount of water to be applied.
5. How to recognize erosion caused by irrigation.
6. How to estimate the amount of irrigation runoff from an area.
7. How to evaluate the uniformity of application.

CRITERIA

General criteria applicable to all purposes stated above.

Irrigation water management shall be based on the general climatic conditions, the soil characteristics (depth, available water holding capacity, salinity, and erodibility), stage of crop growth, and the site features. Significant site features may include, but are not limited to, land slope (for erosion and irrigation uniformity concerns), exposure to prevailing winds, and the presence of windbreaks.

Cultural practices may affect irrigation water management. The use of mulches can assist with the control of weeds, impact infiltration and runoff rates, and reduce evaporation losses.

The soil structure and the presence of organic matter will impact the irrigation water management by affecting the water holding capacity.

The detrimental aspects of over irrigation shall be emphasized to the operator. Examples are wasting of water, leaching of nutrients (making them unavailable to the plant and possibly degrading ground water resources), erosion (with potential reduction in yields, off site sediment and nutrient damages), and creation of micro environments suitable for pests and diseases.

Where runoff from irrigation is a component of the irrigation method, the impacts (both quality and quantity) on the downstream activities will be addressed.

CONSIDERATIONS

The water quality and quantity planning considerations for irrigation water management are:

1. The effects on the water budget, especially on volumes and rates of runoff, infiltration, evaporation, transpiration, deep percolation, and ground water recharge.
2. The potential for a change in plant growth and transpiration because of the changes in the volume of soil water.
3. The effects on downstream flows or aquifers that would affect other water uses or users.
4. The effects on the volume and characteristic (temperature, dissolved substances, nutrients) of downstream flows or aquifers that could cause undesirable environmental, social, or economic effects.
5. The effect on the water table of the field in providing a suitable rooting depth for anticipated land uses.
6. The effects on soil nutrient processes such as plant nitrogen use or denitrification.

The ecological consequences of irrigation including impact on plants and animals (both on the irrigated land and downstream of it) will be addressed in the planning stages.

PLANS

Irrigation water management plans shall be in keeping with the purposes listed in this standard.

Actual evaluation at each irrigation is not required to determine that good water management is being practiced. If the physical layout of the irrigated area meets the requirements of a conservation irrigation system and the irrigator possesses and uses principles of water management, then the requirements of this practice are being met.

OPERATION AND MAINTENANCE

The irrigation water management plan is the operations document for the system and shall be developed to be consistent with the purposes of the practice. Maintenance of the system shall be addressed with the design of the irrigation distribution system.